Remarks/Arguments

This amendment is submitted in response to the Office Action of June 10, 2004, identified as Paper No. 06052004.

In the Action, the Examiner requested that Applicant provide copies of the Disclosure Documents incorporated by reference into the background section of the specification.

Enclosed herewith is a copy of Disclosure Document No. 462,049. Applicant has deleted the references in the specification to the remaining Disclosure Documents.

If the Examiner believes a phone conference with Applicant's attorney would expedite the subsequent handling of this application, please contact the undersigned at (315) 218-8515.

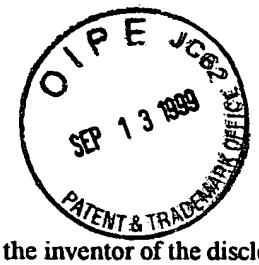
Respectfully submitted,

Dated: August 4, 2004

By _____
George R. McGuire
Reg. No. 36,603

BOND, SCHOENECK & KING, PLLC
One Lincoln Center
Syracuse, New York 13202-8530
315-218-8515

DDH



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HANCOCK & ESTABROOK, LLP
9/10/99

The undersigned, being the inventor of the disclosed invention titled **Advanced Slow-Curing Fire Protection Materials** requests that the enclosed papers be accepted under the Disclosure Document Program, and that they be preserved for a period of two years.

Signed: David J. Legare 9/6/99

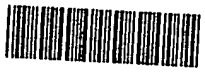
David J. Legare

6594 Driftwood Drive
Ava, NY 13303

Phone # (315)339-3919

*Note: Former address was: 11 Bonnie Ave
New Hartford, NY 13413

DISCLOSURE DOCUMENT NO.



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PTO-1652 (4/96)

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New Hartford, NY 13413

David Legare
9/6/94

Advanced Slow-Curing Fire Protection Materials

The present invention provides for new/modified formulations and production methods for water-bearing silicate-based fire protection materials. The materials referred to here are primarily those related to inventions (patents pending) by the present inventor, Mr. David Legare for the production of fire proof safes and the like. These materials are essentially produced from a combination of sodium silicate solution with a high silica to soda ratio (about 3 to 4, ie. commercial water glass) and a polyvalent metal salt such as calcium chloride. Two problems with the original material formulation are its rapid set-up time and the release of free water on curing after set-up. Both of these have caused manufacturing problems which have increased the cost of the product (currently the FireCooler media safe produced by Thermal Sciences). Methods to reduce the free water released by the curing insulation have been developed (refer to prior Disclosure Documents by Legare) and are currently in use. However, these (such as the addition of calcium oxide or calcium hydroxide) tend to further reduce the material set-up time, making it more difficult to mix and pour. The current goal, therefore, has been to find a way to increase the material set-up time without adversely affecting the other desirable properties such as fire resistance, structural integrity and dryness on curing. The following will describe methods for the accomplishment of the above.

The invention therefore includes the addition of a small quantity of one or more water soluble organic materials to the insulation mixture. Said additives should preferably be mixed thoroughly into the water glass first, with the solids (calcium chloride, calcium oxide, etc.) then added and mixed in to form the slurry. The additive may comprise about 1 to 8 percent of the total weight of the final product (preferably no more than about 2 to 4 percent). It is believed that these materials do not form reaction products with the other components of the mixture and do not alter the chemical or structural properties of the cured insulation. The intent behind the use of these additives is to reduce the solubility and mobility of the other reactants to increase the time it takes for the reaction products to form and to slow the subsequent crystallization/solidification that creates the final product. Three readily available candidate materials have been tested so far with positive results. This would seem to indicate that the concept is valid for most all water soluble organics. However, it is known that certain ones such as low molecular weight alcohols (ie. ethyl and methyl alcohol) may not be practical because they tend to form insoluble gels when they are mixed with the water glass. Other polar compounds such as ethylene and propylene glycol also tend to cause some gelling, but these gels disslove with further mixing causing the formation of a homogenous, although slightly higher viscosity, water glass mixture. Both ethylene and propylene glycol have been tested and work well in the invention. However, propylene glycol is preferred because of its low toxicity as compared to ethylene glycol. A water soluble oil (sold for use as a cutting oil for machining metals) was also tested with good success. As expected, the water soluble oil mixed very easily into the water glass with no gelling. Examples of material formulations tested so far are shown below. The mixing time (time elapsed before the slurry begins to set up and thicken to the point where it can no longer be poured) for each is shown. As a reference, each of the formulations shown would have a mixing time of about 1 to 3 minutes without the presence of the water soluble organic additive. Although it is believed that a very large number of individual water soluble organic compounds and combinations thereof could be successfully used in the present invention, only a few have been tried at the present time. These include ethylene glycol, propylene glycol, and a water soluble machining/metal cutting oil (brand name Rust-Lick WS-5050, Heavy Duty Water Soluble Oil, made by ITW Devcon Corp.). The latter contains a number of components such as tripropylene glycol, chlorinated olefins, and modified petroleum distillates. The above additives are apparent in the example material formulations shown below. Note that all quantities are in parts by weight. Also note that in all cases the water soluble organic additive was first thoroughly mixed into the water glass; the solids (solids are premixed with eachother) are then mixed in to the water glass to form the insulation slurry.

David Legare
9/6/99

EXAMPLES:

1) Water Glass 20
Ethylene Glycol 1
Calcium Oxide 2
Calcium Chloride 3.2
MIXING TIME: 5 minutes

2) Water Glass 20
Ethylene Glycol 2
Calcium Oxide 2
Calcium Chloride 3.2
MIXING TIME: 7 minutes

3) Water Glass 20
* Propylene Glycol 1.2
Calcium Oxide 2
Calcium Chloride 3.2
MIXING TIME: 7 to 8 minutes

4) Water Glass 20
*Propylene Glycol 1.2
Calcium Oxide 2
Calcium Chloride 2.4
**BRITESIL C24 2
MIXING TIME: 12 minutes

5) Water Glass 20
*Propylene Glycol 1.2
Calcium Oxide 2
Calcium Chloride 2.4
MIXING TIME: 12 minutes

6) Water Glass 20
*Propylene Glycol 1.2
Calcium Oxide 2.5
Calcium Chloride 2.4
MIXING TIME: 5 to 7 minutes

- The Propylene Glycol used was an automotive coolant brand mixed 50/50 with water.
- ** BRITESIL C24 is a spray-dried, highly water soluble sodium silicate powder made by the PQ Corporation.

7) Water Glass 20
Water Soluble Oil 1
Calcium Oxide 2
Calcium Chloride 3.2
MIXING TIME: 13 minutes

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8) Water Glass 20
Water Soluble Oil 1
Calcium Oxide 2
Calcium Chloride 2.4
MIXING TIME: 20 minutes

9) Water Glass 20
Water Soluble Oil 1
Calcium Oxide 3
Calcium Chloride 2.4
MIXING TIME: 5 to 6 minutes

10) Water Glass 20
Water Soluble Oil 1
Calcium Oxide 2.5
Calcium Chloride 2.4
MIXING TIME: 10 to 12 minutes